

Borehole

40-04-05**Log Event A****Borehole Information**

Farm : <u>S</u>	Tank : <u>S-104</u>	Site Number : <u>299-W23-124</u>
N-Coord : <u>36,090</u>	W-Coord : <u>75.631</u>	TOC Elevation : <u>665.91</u>
Water Level, ft :	Date Drilled : <u>5/31/1970</u>	

Casing Record

Type : <u>Steel-welded</u>	Thickness, in. : <u>0.280</u>	ID, in. : <u>6</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>135</u>	

Borehole Notes:

The borehole was drilled in May 1970 and completed to 100 ft with 6-in. casing. The borehole was deepened to 135 ft in May 1973. The driller's log makes no reference to perforations or grout. Therefore, it is assumed that the borehole was not perforated or grouted. The casing wall thickness is assumed to be 0.280 in., on the basis of the published thickness for schedule-40, 6-in. casing.

The driller's log states that samples from depths of 42 to 47 ft showed counts of 1,000 to 20,000 counts. It is unknown if the activity was measured in counts per second or counts per minute, but it is assumed that this represents anomalously high activity.

The zero reference for the SGLS logs is the top of the casing. The top of the casing is approximately level with the ground surface.

Equipment Information

Logging System : <u>2</u>	Detector Type : <u>HPGe</u>	Detector Efficiency: <u>35.0 %</u>
Calibration Date : <u>05/1996</u>	Calibration Reference : <u>GJPO-HAN-5</u>	Logging Procedure : <u>P-GJPO-1783</u>

Log Run Information

Log Run Number : <u>1</u>	Log Run Date : <u>06/05/1996</u>	Logging Engineer: <u>Alan Pearson</u>
Start Depth, ft.: <u>0.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>33.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Log Run Number : <u>2</u>	Log Run Date : <u>06/06/1996</u>	Logging Engineer: <u>Alan Pearson</u>
Start Depth, ft.: <u>134.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>47.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Borehole

40-04-05**Log Event A**

Log Run Number :	<u>3</u>	Log Run Date :	<u>06/06/1996</u>	Logging Engineer:	<u>Alan Pearson</u>
Start Depth, ft.:	<u>46.5</u>	Counting Time, sec.:	<u>100</u>	L/R :	<u>R</u> Shield : <u>N</u>
Finish Depth, ft. :	<u>38.0</u>	MSA Interval, ft. :	<u>0.5</u>	Log Speed, ft/min.:	<u>n/a</u>

Log Run Number :	<u>4</u>	Log Run Date :	<u>06/06/1996</u>	Logging Engineer:	<u>Alan Pearson</u>
Start Depth, ft.:	<u>38.0</u>	Counting Time, sec.:	<u>100</u>	L/R :	<u>L</u> Shield : <u>N</u>
Finish Depth, ft. :	<u>32.0</u>	MSA Interval, ft. :	<u>0.5</u>	Log Speed, ft/min.:	<u>n/a</u>

Analysis Information

Analyst : D.L. ParkerData Processing Reference : P-GJPO-1787Analysis Date : 03/07/1997**Analysis Notes :**

The borehole was logged in four log runs with a centralizer used for each log run. The pre- and post-survey field verification spectra for each log run met the acceptance criteria established for peak shape and system efficiency. The energy and peak-shape calibration from the field verification spectra were used to establish the channel-to-energy parameters used in processing the spectra acquired during the log runs. Casing correction factors for a 0.280-in.-thick casing were applied during the analysis.

Cs-137 was the only man-made radionuclide detected in this borehole. Cs-137 contamination was detected almost continuously from the ground surface to 22.5 ft, continuously from 27.5 to 97 ft, and intermittently from 100 ft to the bottom of the borehole. No data were recorded for the depth interval from 39 to 46 ft because of high dead time (greater than 98 percent). The maximum measured Cs-137 concentration was 1,014 pCi/g at about 46.5 ft. However, higher Cs-137 concentrations and other man-made radionuclides may be present in the zone from 39 to 46 ft, where the dead time was too high for spectra to be recorded.

The logs of the naturally occurring radionuclides show an increase in K-40 and Th-232 concentrations at about 55 ft. The U-238 and Th-232 concentrations increase below about 128 ft.

The SGLS total count log plot shows a marked increase in activity at a depth of about 46 ft.

Details concerning the interpretation of data for this borehole are presented in the Tank Summary Data Report for tank S-104.

Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The naturally occurring radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate concentrations.

Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the minimum detection limit (MDL). The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically



Spectral Gamma-Ray Borehole
Log Data Report

Page 3 of 3

Borehole

40-04-05

Log Event A

A combination plot includes both the man-made and naturally occurring radionuclides, the total-count log plot, as well as the Tank Farm gross-gamma log. The Tank Farm gross-gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross-gamma log plot to coincide with the SGLS data.